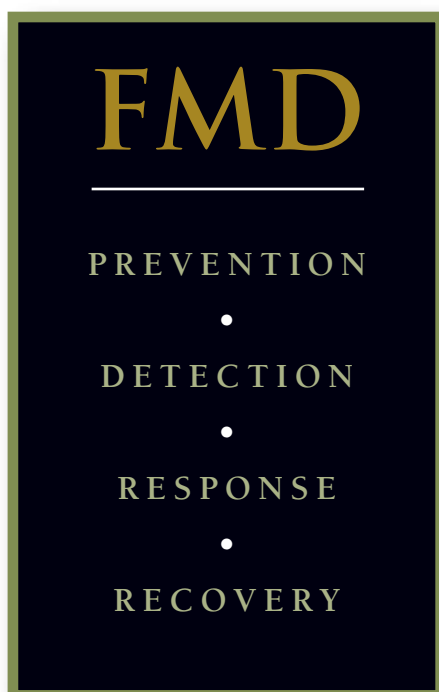


2006 FOOT AND MOUTH DISEASE SUMMIT



HOSTED BY THE ANIMAL HEALTH NETWORK AND THE NATIONAL CATTLEMEN'S BEEF ASSOCIATION



Funded in part by The Beef Checkoff



INTRODUCTION

An English judge and writer of law said, “An ounce of prevention is worth a pound of cure.”

The United States has been free of Foot and Mouth Disease (FMD) since 1929; however, it would take just one cow, one pig or one deer infected with this severe, highly communicable viral disease to erase that status and much of our livelihoods. Although not a human health concern, FMD could devastate our livestock industry and agricultural economy. This stark reality demands the agricultural sector and associated industries develop an effective plan for preventing FMD, and in the event it enters the United States, rapidly containing the disease. In addition, assuring business continuity for livestock producers and associated agribusinesses is critical.

The Animal Health Network (AHN) is a group of the nation’s leading animal health experts who provide beef safety perspectives on behalf of The Beef Checkoff. We strongly believe in benchmarking preparedness and developing clear action steps for effective containment of, communication during and recovery from an FMD outbreak.

In October 2006, AHN and the National Cattlemen’s Beef Association, with partial funding from The Beef Checkoff, hosted the first-ever FMD Summit. This landmark event gathered representatives from organizations and institutions that will be on the front lines during an FMD outbreak. The Summit promoted open dialogue about preparedness, provided a forum to develop preparedness plans and established a preparedness benchmark from which to move forward. The challenges, opportunities and outcomes outlined in this publication are the result of candid discussions by, and diverse opinions of, the Summit attendees.

The Summit focused on FMD preparedness from four critical perspectives — prevention, detection, response and recovery. Presentations included FMD planning and research updates from beef, dairy and pork industry associations, and government entities including the U.S. Department of Homeland Security, the U.S. Department of Agriculture and the National Association of State Departments of Agriculture. Attendees then began defining clear action steps in four working groups: Role of Science in Prevention, Disease Detection, Outbreak Communications and Stopping Disease Progression.

Throughout the Summit, attendees challenged the agriculture sector and government agencies to continue talking about preparedness to ensure recovery if plagued by this devastating disease. This FMD Summit summary is a tool for directing continued efforts related to prevention, detection, response and recovery.

The FMD Summit was an opportunity to regroup on where we are today and make plans for how to get where we need to be tomorrow. Make no mistake, it is critical we get there before we face FMD on our own soil.

Sincerely,

*Bob Larson, DVM, Ph.D., Animal Health Network
Kansas State University*

*Guy H. Loneragan, B.V.Sc., Ph.D., Animal Health Network
West Texas A&M University*

SPEAKER PRESENTATIONS SUMMARY

During the Summit, participants heard updates on Foot and Mouth Disease (FMD) planning and research from the U.S. Department of Agriculture (USDA), the Center for Animal Disease Modeling and Surveillance (CADMS), the U.S. Department of Homeland Security (DHS), the National Association of State Departments of Agriculture (NASDA), the Southeastern Cooperative Wildlife Disease Study (SCWDS), the National Milk Producers Federation (NMPF), the National Pork Board (NPB) and the National Cattlemen's Beef Association (NCBA).

CURRENT STATE OF USDA'S FMD PLAN

*John Clifford, DVM, Deputy Administrator of Veterinary Services
U.S. Department of Agriculture, Animal and Plant Health Inspection Service*

Many of the FMD plans USDA's Animal and Plant Health Inspection Service (APHIS) has in place today are the result of lessons learned from the United Kingdom outbreak. The current APHIS FMD plan has four parts: exclusion, surveillance, preparedness and response.

EXCLUSION. APHIS has import regulations and point-of-entry surveillance that prevent potentially diseased animals and products from entering the United States. Also, restricted trade with FMD-affected countries helps keep the United States FMD free. This includes countries that have FMD and countries that vaccinate against FMD. However, the United States has regionalized some FMD-free areas within a country to allow for beef exports to the United States.

SURVEILLANCE. Passive reporting and active surveillance by industry help APHIS rapidly detect diseases upon introduction. Continual surveillance also proves freedom from disease to trading partners.

RESPONSE PREPAREDNESS. APHIS maintains FMD preparedness with the help of the National Animal Health Emergency Response Corps (NAHERC), North American FMD Vaccine Bank (NAFMDVB), the National Veterinary Stockpile (NVS) and the National Animal Health Laboratory Network (NAHLN).

- NAHERC is a roster of private and state animal health technicians and veterinarians that can be activated quickly for temporary federal personnel to help meet emergency staffing needs.
- NAFMDVB acquires, stores and ensures quality control of vaccine concentrates and seeds. Antigen eight is currently in production, antigens nine and 10 are scheduled to be tested in 2007 and contracts for six more antigens are in negotiations. NAFMDVB also monitors activity of virus strains globally to help determine which strains should be acquired in the future.
- NVS contains ready-to-use emergency response supplies related to vaccination, diagnostics, euthanasia, disposal and disinfection.
- NAHLN consists of 48 state, academic and federal laboratories.

RESPONSE GUIDELINES. During an outbreak, the APHIS rapid response focuses on three areas: containment, eradication and carcass disposal. The agency uses a decision tree to determine when vaccination is appropriate and needed. Vaccination could be used in two ways to limit FMD spread: farms closest to the reported cases could be vaccinated, or a zone around the affected area could be vaccinated from the outside in.

MODELING: IMPLICATIONS OF DECISIONS AFFECTING FMD CONTROL & ERADICATION

*Tim Carpenter, Ph.D., co-Director, Center for Animal Disease Modeling and Surveillance
Department of Medicine and Epidemiology, University of California-Davis*

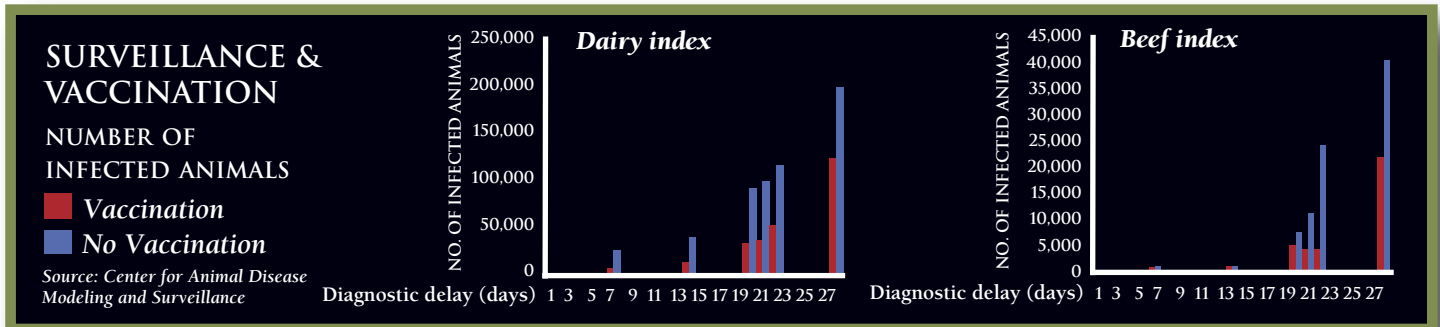
The Center for Animal Disease Modeling and Surveillance, located in the veterinary school at the University of California-Davis, collects data on livestock populations in the United States to create simulation models that predict disease spread in an FMD outbreak and evaluate alternative control strategies such as vaccination and stop-movement orders. Faculty and researchers are working to avoid the catastrophic outcome of the 2001 United Kingdom FMD epidemic, which affected more than 10,000 farms, resulting in 6-10 million animals being slaughtered and costing more than \$15 billion.

CADMS currently has enough input data to run extensive simulations for three counties in California and limited simulations for the state. CADMS is expanding data collection to run FMD simulations for the entire United States. Data collected includes location and type of livestock premises and frequency and type of contacts (i.e. trucks, veterinarians and breeding animals moving on and off farms and ranches). These contacts are important because they can act as vectors to transport the FMD virus.

Using input data, CADMS has run several simulated outbreaks of FMD in California. Although the effect of vaccination in cattle is similar among individual dairy or beef cows, simulations show that vaccination in the dairy sector greatly reduces disease spread. The simulations also show an FMD outbreak in beef cattle would not be as extreme as an FMD outbreak in dairy cattle, mostly because the dairy industry has a greater number of contacts that could act as vectors for spreading the disease. The simulated FMD outbreaks in California also highlighted the model's sensitivity. When the simulated FMD epidemic was detected early, the number of infected animals and premises, as well as duration of the epidemic, were greatly reduced.

Importantly, these results currently apply only to a limited area in California. Similar simulations will be run for other parts of the United States as data are collected and analyzed.

The more input data CADMS can obtain, the more accurate the FMD prediction models are. Livestock producers can contribute to FMD-outbreak modeling by entering premise and contact information at <http://www.cadms.ucdavis.edu/>. The Department of Homeland Security and the U.S. Department of Agriculture help fund CADMS, and therefore, all the information and resulting data is handled with the highest level of confidentiality. Collected data are maintained at CADMS for use exclusively in disease modeling.



PANEL 1: GOVERNMENT ROLES AND COORDINATION DURING AN FMD OUTBREAK

Moderator: Guy Loneragan, B.V.Sc., Ph.D., West Texas A&M University, Animal Health Network

DEPARTMENT OF HOMELAND SECURITY: CRITICAL ASPECTS OF FMD PLANNING

Tom McGinn, DVM, Director of Veterinary and Agricultural Security, Office of the Chief Medical Officer
 U.S. Department of Homeland Security

The U.S. Department of Homeland Security focuses on four critical aspects of FMD preparedness: implementing a national response plan in the case of an FMD outbreak; anticipating the movement of this highly contagious disease to successfully contain it; considering the potential economic effects of an FMD outbreak; and preventing FMD from being used as a weapon of agroterrorism.

DHS recognizes four critical aspects of FMD planning: prevention, detection, disease containment and communication. As the lead agency in an FMD outbreak, DHS appreciates the importance of developing plans now so government agencies are able to effectively work together and coordinate with industry groups in the case of an FMD outbreak.

PREVENTION. Preventing an FMD outbreak is critically important in today's society as most people depend on someone else to provide food for them. DHS takes any threat of agroterrorism or a biosecurity event very seriously, and the entire department remains vigilant to prevent any kind of attack. Part of this vigilance includes measuring and understanding vulnerabilities through modeling.

DETECTION. In a biosecurity event, early detection leads to early response, which decreases damage to the industry. Detection begins with citizen awareness and continues with technology. Global Positioning System (GPS) imaging is an example of a tool that can help in disease detection. Tools developed in the future will help immensely with disease detection, but people must be trained on how to use technology properly.

CONTAINMENT. Decisions about the actions that will be taken to stop and control FMD must be made now so there is no hesitation or uncertainty in the event of an outbreak. Response teams need to be built at the local and state levels as their response is critical during the first days of an outbreak. Industry leaders and the appropriate federal government agencies need proper training on responding to an FMD outbreak. Stopping disease progression during an outbreak is important because agriculture must be prepared to conduct business during and after a major disaster.

COMMUNICATION. At all levels, a coordinated communication strategy must be developed. Communication planning must include development of effective messages for government and industry groups. Emergency management groups should develop plans for regular public communication and coordinate schedules and messages with industry groups.

ROLE OF STATE DEPARTMENTS OF AGRICULTURE

*Orlo (Bob) Ehart, Animal and Plant Health Safeguarding Coordinator
National Association of State Departments of Agriculture*

The way emergency situations are handled changed after Sept. 11—two tracks now exist for dealing with emergencies. One track applies to intentional (terrorist) incidents and one to unintentional emergencies.

To make the new system operational, President Bush issued the first of a new series of Homeland Security Presidential Directives (HSPDs) governing homeland security policy on Oct. 29, 2001. Four of the HSPDs provide direction to government agencies in the event of an FMD outbreak, including: HSPD-5, Management of Domestic Incidents; HSPD-7, Critical Infrastructure: Identification, Prioritization and Protection; HSPD-8, National Preparedness; and HSPD-9, Defense of U.S. Agriculture and Food.

Details are spelled out in a National Response Plan and National Incident Management System, which were developed subsequent to Sept. 11. Under HSPD-7, agriculture has been established as a critical infrastructure (authorized) but is still considered an option—not a mandatory priority—for funding (appropriation), leaving planning for potential agricultural emergencies underfunded in many states.

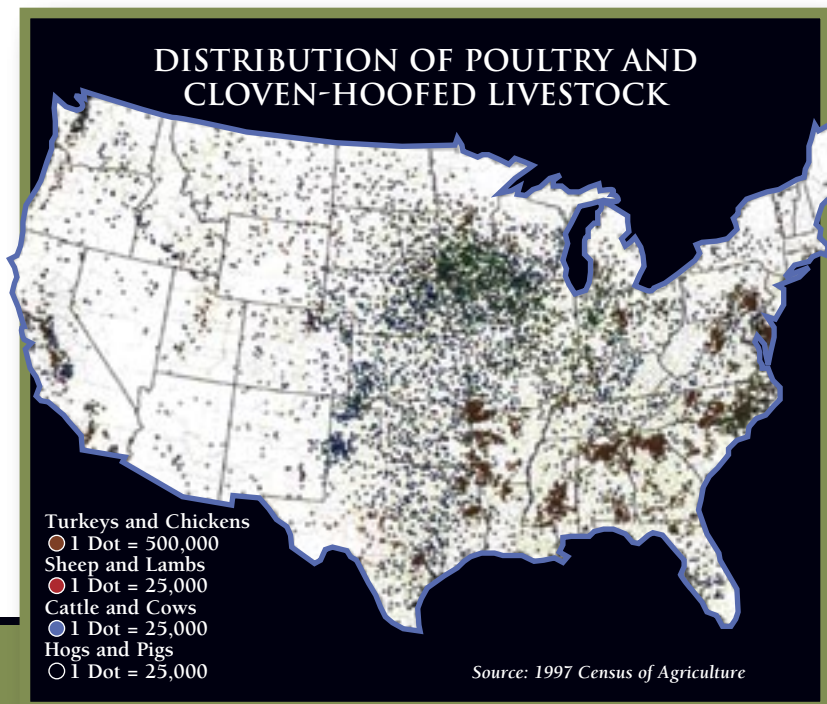
In the event of an emergency, it is customary for a local, municipal or county emergency management office to respond. However, local governments seldom have adequate authority to deal with animal health emergencies. In these instances, a state agency such as a department of agriculture, animal health commission or livestock board, will serve as the lead state

Industry and government organizations have made a lot of progress in planning for an FMD outbreak, but there is still a long way to go. Food is the cornerstone of every great society, and our ability to continue to feed ourselves as a nation is something that should not be taken lightly.

agency, and if a foreign animal disease is suspected, USDA–APHIS also will respond as the lead federal agency. State governments need to be highly connected with local, municipal and county governments if animal emergencies are to be handled seamlessly.

The level of government involvement and the type of resources expended in an animal health emergency depend on the magnitude of the emergency.

- In a small-scale emergency, local officials respond and local resources are expended first; however, this level of involvement is not likely to occur in an animal health emergency. Regardless, local officials still need to understand the role they play in an outbreak.
- In a larger-scale emergency, and in most animal health emergencies, the state emergency management agency and state agricultural officials institute their emergency management plan. A joint command center likely will be established with APHIS, although the state will still dedicate a large amount of time and resources. The governor may declare a state of emergency if a situation escalates or is larger than initially assessed. More state resources can then be dedicated to the event. The governor also can request assistance from the federal government and a Presidential Disaster Declaration issued. These declarations are usually used for natural disasters, but are applicable if human life, critical agriculture and food infrastructure or the national economy is threatened. Once a federal declaration is in place, federal resources can be used to deal with the emergency. In addition, the Federal Emergency Management Agency (FEMA) and other applicable federal agencies can become involved.
- If terrorism is suspected, law enforcement (federal and state) will take the lead and animal agriculture agencies will perform secondary support functions. If a foreign animal disease is diagnosed, federal resources and oversight will be applied immediately. In the case of an FMD outbreak, terrorism will be a suspected origin until proven otherwise.



WILDLIFE IMPLICATIONS

John Fischer, DVM, Ph.D., Professor, University of Georgia College of Veterinary Medicine
Director, Southeastern Cooperative Wildlife Disease Study

Fish and wildlife recreation in the United States is a booming business, with 82 million Americans spending \$109 billion annually on wildlife-associated recreation. Cloven-hoofed species, whether wild or domestic, are susceptible to FMD. The North American cloven-hoofed wildlife species that are of primary concern include white-tailed deer, mule deer, elk, bison, pronghorn and feral swine.

As of today, there are no plans in place to systematically depopulate wildlife to control an FMD outbreak because it is physically impossible and socially unacceptable. In countries where FMD has occurred, wildlife has not played a significant role in the spread or maintenance of the disease. Once eradicated from domestic livestock, FMD has not remained in free-ranging wildlife. The most efficient control method is immediate removal of infected and exposed livestock to prevent transmission to other livestock or wildlife. Surveillance of wildlife may be warranted if susceptible wildlife species have been exposed to infected livestock. If wildlife is found to be a risk factor, local population density reduction may be needed to prevent the spread of FMD.

The Southeastern Cooperative Wildlife Disease Study (SCWDS) assists APHIS-Veterinary Services (VS) in preparation, training, surveillance and response to foreign animal diseases such as FMD. Since 1979, SCWDS has had recurring annual cooperative agreements with APHIS-VS to provide these services to APHIS, as well as to:

- Determine disease relationships between wild and domestic animals.
- Advise APHIS on wildlife management and the relationship to domestic animal health.
- Serve as liaison among state, federal and private sectors responsible for wildlife, domestic animal and human health in the United States.

Wild animals, like domestic animals, have significant value to the national economy. If susceptible wildlife species are present in an area affected by FMD, surveillance is recommended to determine whether infection has spread to wildlife, and if so, whether FMD is being maintained or spread by wildlife. Passive surveillance of sick or dead wildlife may be adequate, or active surveillance may be necessary.

QUESTIONS & ANSWERS

Following their presentations, John Clifford, Tim Carpenter, Tom McGinn, Bob Ehart and John Fischer answered several questions from Summit attendees.

INDEMNITY. Clifford addressed questions about the federal government's indemnity plan in the event of an FMD outbreak. According to Clifford, USDA plans to pay 100 percent of the fair market value for animals killed to contain an outbreak or eradicate FMD. In the past he said the government has paid for disposal costs. As far as lost milk production, Clifford said the federal government typically only pays for the animal. However, the U.S. Secretary of Agriculture has authority to pay for losses from infectious materials caused by a disease event. Beyond that, there are many remaining questions policy makers need to consider.

VACCINATION. Clifford also responded to questions about the federal government's vaccination policy. USDA does not plan to vaccinate animals as a preventative measure against FMD. During an outbreak situation, vaccination only would be used as a firewall unless officials were unable to immediately contain and eradicate the disease; in which case, a vaccination control strategy would be implemented. According to Clifford, if the disease was contained and eradicated quickly, vaccinated animals would be destroyed so the United States could expedite

its return to "FMD-free without vaccination" status. However, if the outbreak was widespread, the government would consider not destroying vaccinated animals.

McGinn said Differentiating of Infected from Vaccinated Animals (DIVA) tests may be recognized by the World Organization for Animal Health (OIE) as a way of determining whether an animal with FMD antibodies has been naturally infected or vaccinated. However, he said trading partners may not recognize this differentiation.

BIOTERRORISM. If an FMD outbreak is an act of bioterrorism, there may be multiple, separate introductions of the virus. However, Clifford said USDA's FMD response plan is the same whether introduction of the FMD virus is intentional or accidental. USDA is focused on animal health, not a criminal investigation, but will assist in an investigation. McGinn added that law enforcement officials such as the Federal Bureau of Investigation (FBI) or the State Bureau of Investigation (SBI) should be involved in the investigation process from the beginning because it is possible law enforcement officials may take over the investigation at some point.

PANEL 2: COMMODITY PERSPECTIVE AND FMD PLANS

Moderator: Bob Larson, DVM, Ph.D., Kansas State University, Animal Health Network

DAIRY INDUSTRY

John Adams, Director, Animal Health and Farm Services
National Milk Producers Federation

Three major concerns for dairy producers are hardening the farmstead against human exploitation and natural emergencies; strengthening herd health biosecurity; and producing safe and wholesome milk and meat.

HARDENING THE FARMSTEAD AGAINST FMD. In order to better protect dairy farms from FMD, the dairy industry is working to limit access at the farm entrance, post signs to inform visitors of proper safety procedures, closely monitor traffic on and off the farm, and, in the case of an FMD outbreak, stop all movement of animals on and off the farm.

STRENGTHENING HERD HEALTH BIOSECURITY. The dairy industry considers the greatest herd health risk to be introducing new animals without quarantine or testing. The 2002 National Animal Health Monitoring System (NAHMS) Survey found that only one-in-five operations quarantines new animals before introducing them into the herd. The dairy industry recommends new animals be isolated in a designated quarantine area off-site for a minimum of 21 to 30 days. New animals should not be allowed nose-to-nose contact, common feeders and waterers or shared air space with resident cattle. A maximum distance between resident and incoming cattle should be maintained to reduce airborne disease transmission. The NAHMS survey also found that more than three-quarters of U.S. dairy operations did not require testing of cattle before on-farm introduction.

PRODUCING SAFE AND WHOLESOME MILK AND MEAT. The FMD Dairy Research Working Group was formed in 1999

PORK INDUSTRY

Patrick Webb, DVM, Director, Swine Health Programs
National Pork Board

The No. 1 goal of an FMD response program is recovery, or “business as usual.” The pork industry believes there are four steps to recovery, and each step poses unique challenges.

DISEASE DETECTION. Producers are the first line of detection in an animal disease situation; veterinarians are the second. Both the producer and the veterinarian need to know what signs and symptoms to look for, how to report FMD if found, the importance of foreign animal disease investigation and proper biosecurity precautions.

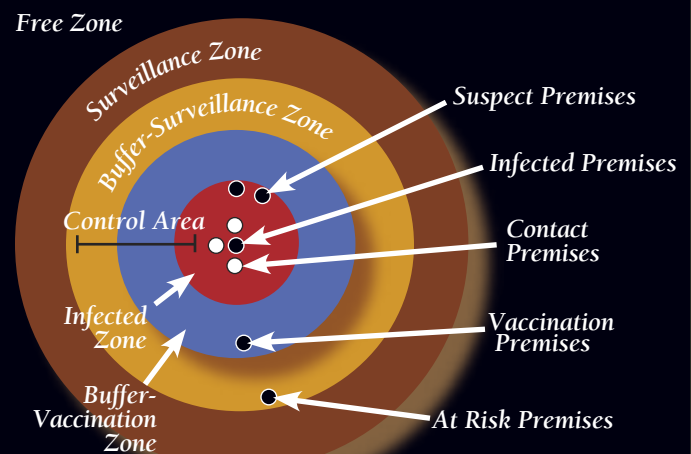
DISEASE CONTAINMENT. Rapid disease containment starts with being able to identify all premises and industry assets within the control area. The control area consists of the infected zone and the buffer surveillance zone. Farms within the control area need to be rapidly identified and contacted in order to help their operators understand the situation and implement biosecurity protocols. This would include any infected premises, contact premises or suspect premises inside the control area.

to bring the dairy industry and government together to develop practical recommendations for FMD planning, preparedness, recovery and sustainability. The working group discovered six major gaps in FMD preparedness: a focus on vaccination as a national priority and strategy; on-farm disposal options; tanker biosecurity; disinfection research; a national recovery policy; and regional continuity of business plans.

In the event of an FMD outbreak, milk must continue moving through commerce so dairy producers can sustain their businesses. Research shows that pasteurization prevents the spread of the FMD virus through milk. Therefore, it is important to move milk to pasteurization as quickly and safely as possible. The industry also is working to develop milk tanker truck filter systems to prevent aerosolized virus entrapped within the milk from escaping so as to permit safe movement of milk prior to, and during, an outbreak.

Proper biosecurity at the farm level will go a long way toward preventing transmission of a highly contagious disease such as FMD. Producers must work with government at all levels to ensure that both the public and private sectors are prepared to prevent introduction and transmission of any highly contagious foreign animal disease agent. In addition, these players also should work together to develop an all-hazards prevention and recovery-based emergency animal health operation plan, using FMD as the template disease.

CONTROL AREA & ZONE DESIGNATIONS



Source: Adapted by Dr. Patrick Webb from the text of the September 2006 NAHMS Guidelines: Response Strategies for Highly Contagious Diseases

The area around the control area is the surveillance zone, which is part of the free area. However, some farms in this zone may be asked to implement surveillance to ensure the disease has not spread outside of the control area. With some diseases, the control area may be fairly small, the size of a county for example. In the case of an FMD outbreak, it is likely that the zones will be much larger — potentially encompassing an entire state. Everyone who will potentially be involved in an animal disease disaster at the local level (including county extension veterinary practitioners, local law enforcement and local fire departments) should go through animal disease disaster training.

DISEASE ERADICATION. The faster a disease is traced back to the infected and exposed premises, the greater the chance eradication will be successful. Euthanasia and disposal strategies are not as practical in a large outbreak. In large outbreaks,

BEEF INDUSTRY

*Gary Weber, Ph.D., Chief Operating Officer, Harrison Ethanol, LLC
Former Executive Director, Regulatory Affairs, National Cattlemen's Beef Association*

In regard to crisis response, Bovine Spongiform Encephalopathy (BSE) taught the beef industry many important lessons. However, FMD has the potential to be much worse. One isolated BSE case is very different than one highly contagious case of FMD, both in containing the disease and managing the economic and industry losses.

While BSE and FMD are very different diseases, many consumers think they are the same. In addition, public opinion research shows that many consumers think FMD affects humans. In the event of an FMD outbreak, it will become vitally important to immediately communicate to consumers that the disease is not a public health issue.

Rapidly detecting FMD is critical to limiting the scope of an outbreak. Producers need to be able to recognize the symptoms of the disease, know what biosecurity steps to take and have a clear understanding of the government's plan for indemnification,

vaccination can become a critical tool for stopping disease spread, but it also poses several questions: At what point in a disease outbreak does vaccination become an acceptable practice? Is there enough vaccine? What are the protocols? Can immune-modulators such as interferon be used to prevent disease spread?

MAINTAINING BUSINESS CONTINUITY. Animal well being and daily care will be challenging during an FMD outbreak. Industry assets — such as feed providers, meatpacking plants and milk processing plants — will need to implement disease control methods in order to remain FMD free. Protocols need to be developed for including industry assets as tools for disease response. Producers also need proof of negative testing developed to help them maintain continuity of business.

vaccination and depopulation. Producer education about FMD is a challenge — a state survey indicated 52 percent of producers may not be able to recognize the symptoms of FMD.

In regard to disease management, a stop-movement order is almost as effective as vaccination in stopping the spread of FMD. However, 2-3 million head of cattle move throughout the country each week, making a stop-movement order challenging. In addition, one auction market may sell 6,000 head of cattle in one day and load 115 semi-trailer trucks to travel to 10 states.

Managing FMD entirely through depopulation is not feasible during an outbreak because of consumer perceptions and expectations, producer reactions, the equipment and resources needed and environmental consequences.

The industry needs to be asking some critical questions right now. What is at stake? What is the industry willing to invest? How much time is available? What is the return on investment?

QUESTIONS & ANSWERS

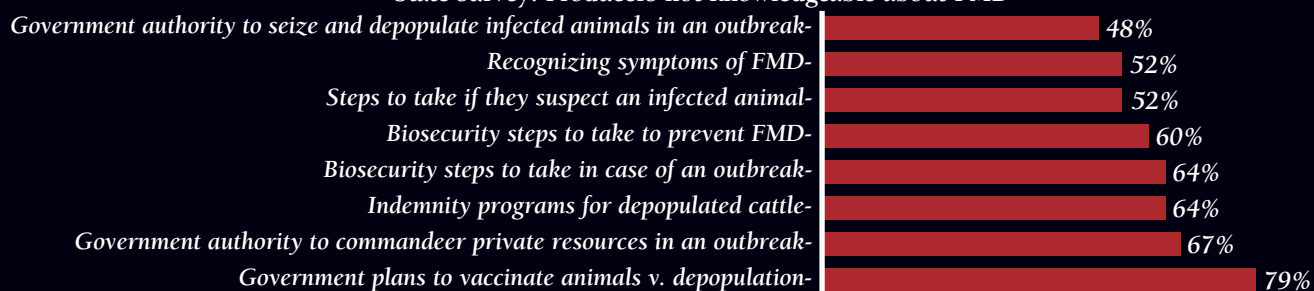
Following their presentations, John Adams, Patrick Webb and Gary Weber were asked to name the tools they would want in their FMD preparedness toolkit.

Adams said he would like a business continuity plan, rapid diagnostic ability and a differential vaccine. Webb would like to be able to prove FMD-negative status for animals within and

outside an FMD quarantine zone, develop a national plan for continuity of business within regions and coordinate FMD preparedness between the public and private sectors. Weber said he would like the United States and its trading partners to work out an FMD-vaccination agreement, and he wants chute-side tests that accredited veterinarians can use to rapidly diagnose FMD.

CHALLENGE: PRODUCER EDUCATION

State survey: Producers not knowledgeable about FMD



Source: National Cattlemen's Beef Association 2006 Survey of State Partner Organizations

Percent of states saying producers are not knowledgeable

WORKING GROUPS SUMMARY

After hearing presentations from government and industry representatives, Summit participants divided into working groups to further discuss challenges and priorities and develop next steps for Foot and Mouth Disease (FMD) preparedness.

In the Role of Science in Prevention working group, members reviewed existing programs and emerging scientific research for eradicating FMD and containing an outbreak in the United States. The Disease Detection working group discussed the detection and testing processes for FMD, as well as methods for coordinating among local, state and federal first responders. The Outbreak Communications group discussed and established key communication strategies aimed at national and international consumers, as well as various sectors within the production chain. The Stopping Disease Progression working group delved into research and weighed the implications of vaccination, depopulation, quarantines and stop-movement orders.

ROLE OF SCIENCE IN PREVENTION

Moderator: Guy H. Loneragan, B.V.Sc., Ph.D., West Texas A&M University, Animal Health Network

The Role of Science in Prevention working group met at the FMD Summit to discuss and develop scientific, actionable initiatives to help prepare for an FMD outbreak — especially in the critical prevention phase.

INTRODUCTION. Moderator Guy Loneragan first differentiated this working group from others, describing how it was tasked with discussing the prevention pillar of FMD.

Dr. Tom McKenna, a livestock exotic disease expert and director of the Animal and Plant Health Inspection Service (APHIS) Plum Island Animal Disease Center's Foreign Animal Disease Diagnostic Laboratory, began the discussion by giving an overview of the Plum Island facility's research capabilities, recent research developments and research priorities. McKenna discussed current detection capabilities including antibody detection and agent detection. He explained that in order to develop FMD vaccines, B cell cultures must be produced, the virus inactivated and the antigen purified. McKenna noted that vaccines take seven days to "complete" subtype characterization when a more immediate detection is preferred. Vaccines are effective in controlling clinical signs, but do not completely protect against infection. Vaccinated animals may still become a carrier and a source of virus for other animals.

McKenna noted that the North America FMD Vaccine Bank is stored at Plum Island. However, the vaccines are not outbreak-ready, as they are in concentrate form and need to be prepared for delivery.

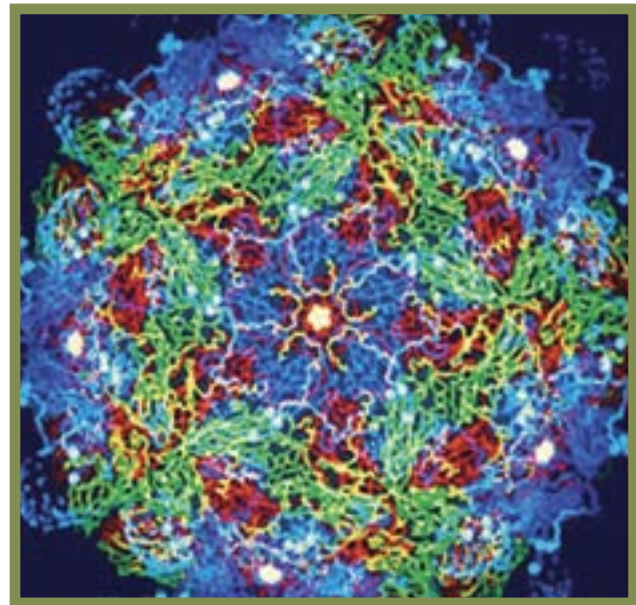
CHALLENGES. Working group participants discussed key challenges and knowledge gaps. The group agreed that overall prevention is the biggest challenge. If an outbreak is detected, the key challenge is addressing the consequences of the outbreak. Other challenges the group identified included:

- Ecological niche of FMD
 - At the source and by strain
 - Mechanisms of persistently infected animals

- Delay in detection
 - Index case
 - Ramp-up of vaccine development following detection of index case
- Limited vaccine technology
 - Univalent
 - Slow ramp-up

The working group then identified strategic needs for scientific advancement including:

- Developing a vaccine with the following characteristics: high-technology, multivalent, broad-based delivery system, prevents shedding, long-term stability, Differentiating of Infected from Vaccinated Animals (DIVA) or marker, quick onset of immunity and validation of current vectored vaccine
- Reducing response time, reducing time to detection of index case and developing new testing methodology



Computer-generated image of FMD virus



HURRICANES KATRINA AND RITA PROVIDE LESSONS FOR FMD PREPAREDNESS

Louisiana Cattle Producers Share Their Experiences at the FMD Summit

Successful Foot and Mouth Disease (FMD) preparation, detection, response and recovery will be exponentially improved if industry and government learn from past experiences. The entire country remembers the devastation hurricanes Katrina and Rita caused in New Orleans and other coastal cities in August and September 2005, but the country sometimes overlooks the tremendous losses suffered by the agricultural sector in the area. At the Summit, Louisiana Cattlemen's Association and Louisiana Beef Industry Council leaders delivered a keynote address sharing their hurricane experiences and the resulting lessons that could be applied during, and after, an FMD outbreak.

Immediately after the 2005 storms, National Cattlemen's Beef Association members and cattle producers nationwide rose to the occasion and donated feed, supplies and even bulls to affected producers. Donations traveled to the area for distribution, but government road blocks, like the appropriation of highly sought after fuel to industries other than agriculture, made it very difficult to reach producers with the donated items.

Because the government's response concentrated on highly populated areas, government assistance, supplies and authority did not reach many rural areas. Today, many producers feel they have not received the correct indemnity payments due to rules enacted before the hurricanes caused their damage.

As the livestock producers affected by hurricanes Katrina and Rita enter the recovery phase, the need for government and industry to communicate about FMD and natural disaster plans becomes even more evident.

PRIORITIES. The Role of Science in Prevention working group identified several short- and long-term priorities:

Short Term

- Validating current vectored vaccine and developing new methodology for detection
- Reducing response time (time from suspicion to vaccine availability and time to index case)
- Understanding challenges to implementing biosecurity plans on farm
- Developing a decision tree to assist with depopulation decisions that takes into account societal/community needs rather than simply resumption of trade

Long Term

- Vaccine development
- Immunomodulation solution
- Basic science of ecology of virus

NEXT STEPS

Working group participants suggested the following next steps as the most immediate action items:

- Support funding to meet research priorities
- Fund and support global alliances with respect to FMD research and diagnostics (e.g. Global Foot-and-Mouth Disease Research Alliance)
- Engage and support progress of National Bio and Agro-Defense Facility
- Study on-farm biosecurity plans in use by producers
- Add an animal-health disease arm to the Beef Industry Food Safety Council (BIFSCo) that would promote interface between industry and government

The Role of Science in Prevention working group concluded that there is still much to be learned about the FMD virus, and while the ultimate prevention success is to keep it out of the United States, the industry needs to be pragmatic and prepared to minimize the consequences if an FMD outbreak does occur.

DISEASE DETECTION

*Moderators: Patty Scharko, DVM, University of Kentucky, Animal Health Network
Mike Baker, Ph.D., Cornell University, Animal Health Network*

The Disease Detection working group was charged with a critical task at the FMD Summit: identify successes, challenges and needs related to FMD education and diagnosis. The working group focused on strategies for educating and preparing key stakeholders to quickly identify FMD and, thereby, limit virus spread. Livestock producers, veterinarians and first responders are the first lines of defense against FMD.

INTRODUCTION. Moderators Patty Scharko and Mike Baker opened the Disease Detection session by reviewing the working group's key goal: to leave with a clear understanding of what needs to be done to prepare livestock producers and first responders to quickly stop an FMD outbreak.

Patrick Webb, director of swine health programs for the National Pork Board (NPB), kicked off the working group session by giving the group more detail on NPB's interactive, tabletop education program which simulates an FMD outbreak. Educating producers is a focus for NPB in Iowa through this hands-on education initiative that brings livestock producers together with first responders and emergency management personnel to discuss the importance of preparing for foreign animal diseases. These role-playing and realistic modeling activities open lively dialogue between producers and their local emergency responders about biosecurity, resource distribution, indemnity, burial sites and euthanasia.

Bob Ehart, Animal and Plant Health Safeguarding Coordinator for the National Association of State Departments of Agriculture (NASDA), updated the working group on the key challenges to FMD detection from a state's perspective. Ehart included insight about the need for more and varied surveillance methods, attention to vaccination as a policy issue, elimination of inconclusive and false-positive tests and focus on surveillance tools rather than disease management tools.

Finally, the working group heard from Eric Welling, supervisor of the Federal Bureau of Investigation's (FBI) joint terrorism task force in Oklahoma. Welling informed the group of the policies and procedures FBI intends to follow during an FMD investigation to determine whether the outbreak was caused by an act of terrorism. Welling said if the outbreak is deemed intentional, FBI will take a leadership role in the investigation but will work with scientists and the industry to try to keep the outbreak contained.

CHALLENGES. Following the introductory presentations, the working group identified FMD detection challenges in two main areas: education and diagnosis. Within these two areas, participants determined the primary challenges to be:

- Not enough "boots on the ground" to educate producers about FMD detection
- Alternative audiences, such as transportation providers and livestock auction employees, are not being educated
- FMD is not top-of-mind with livestock producers
- Premises data and certification/surveillance systems are necessary, but not fully utilized
- Not enough veterinarians
- Industry perception that FBI will deter disease investigation

Participants then determined in order to meet the challenges presented, more producer education materials and programs, as well as more educators, are necessary. Also, alternative

audiences, such as customs and border control officials, cattle transporters, livestock auction employees, Native Americans and goat producers, need to be educated about FMD. In addition, concentrated efforts through appropriate data, is needed to accomplish FMD surveillance.

Within the two areas of focus for the working group — education and diagnosis — the participants developed short- and long-term priorities and determined the short- and long-term action steps to move toward a stronger FMD education program and a more complete diagnosis protocol.

PRIORITIES.

Short-Term Education

- Collect existing education materials from all sources

Long-Term Education

- Ensure consistent funding for all types of FMD education
- Educate veterinarians, transportation providers and livestock auction employees about FMD

Short-Term Diagnosis

- Support "sniffer" technology that identifies FMD in the air
- Coordinate with emergency management

Long-Term Diagnosis

- Long-term surveillance plan
- Rapid chute-side test
- Data to direct surveillance

NEXT STEPS

Education

- Collect and evaluate existing educational tools from the U.S. Animal Health Association, NASDA, Emergency Management groups, APHIS-Veterinary Services and State Beef Quality Assurance coordinators
- Initiate a small group to review materials for usefulness and appropriate audience
- Consider development of informational materials (wallet cards, posters, etc.)
- Develop template education programs to request additional funding from government and private sources
- Ensure veterinarian accreditation program includes FMD continuing education requirements
- Build on existing transportation provider education program to include FMD information, symptoms and procedures

Diagnosis

- Communicate support for "sniffer" technology research and recommendation to implement when ready
- Distribute policy on area emergency coordinators to state industry groups and cooperative extension
- Encourage relationship-building between industry groups, local and area emergency coordinators and state veterinarians
- Keep Disease Detection working group updated on National Surveillance Unit plan

FMD SUMMIT FEEDBACK

*What did you like best
about the FMD Summit?*

*“The Summit
brought together the
groups necessary
to actually begin to
make a difference
for the problem.”*

*“I enjoyed having
government and
industry in
the same room
to discuss the issue.”*

*“[The Summit was
a chance for]
networking, action
steps for readiness,
learning what
our partners
are doing and what we
can do together.”*

Source: FMD Summit Meeting Evaluation Results, October 2006

OUTBREAK COMMUNICATIONS

*Moderator: Kendal Frazier, Vice President,
Public Opinion and Issues Management
National Cattlemen’s Beef Association*

The Outbreak Communications working group met at the FMD Summit to discuss and establish communication strategies aimed at national and international consumers, as well as all sectors of the production chain. Participants discussed the unique challenge FMD presents to communicators who need to educate audiences using messages that may not be appropriate until an outbreak occurs.

INTRODUCTION. Moderator Kendal Frazier started the Outbreak Communications session by reviewing the working group’s goals:

- Identifying key challenges, strategic needs and actionable initiatives to further prepare for communicating about FMD in an outbreak situation
- Developing communication priorities and plans to build on what is already in place

Ed Curlett, public affairs specialist with APHIS, kicked-off the discussion by walking through the APHIS Emergency Response Communications Plan. The group asked Curlett to comment on how the agency plans to handle rumors and speculation occurring before an FMD case is officially confirmed. He said APHIS plans to distribute information as soon as possible, even prior to confirmed results. In addition, he explained that the APHIS notification process is triggered when the U.S. Department of Agriculture decides to make a public announcement. In response to another question from the group, Curlett said the agency plans to incorporate industry communicators, either on-site or as part of the response effort, as soon as a Joint Information Center is established. Curlett also shared that APHIS learned from responding to Avian Influenza that making a public statement is important.

The National Cattlemen’s Beef Association Executive Director of Issues Management, Rick McCarty, identified critical challenges of communicating about FMD with consumers. He shared the findings from a consumer survey funded by The Beef Checkoff and fielded at the end of September 2006, which found consumers are not very familiar with this animal disease, and 69 percent think FMD can affect people who eat meat from infected animals. Consumers flunked a true/false quiz questioning them about the characteristics of FMD. The data suggest consumers may be confusing FMD with “mad cow” disease or Bovine Spongiform Encephalopathy (BSE). In fact, 37 percent said FMD is another name for BSE, 52 percent thought several cases of FMD were found in the United States this year and 56 percent believe FMD is caused by bacteria that infects animal feed.

CHALLENGES. Using these introductory presentations for background, working group participants discussed the biggest communication challenges facing the industry in the event of an FMD outbreak. The group identified a number of concerns related to effectively managing media interest; reassuring consumers; and explaining the detection and response stages of an outbreak to both the public and livestock producers. Participants determined the primary challenges to be:

- Answering the question “Am I safe?” for consumers
- Communicating with producers about what they should do
- Coordinating among the various agriculture industry organizations (especially the affected species groups) and government agencies at different levels
- Dealing with hostile consumer advocacy and anti-meat groups
- Answering the question “Exactly where is/are the infected animal(s)?” for the media, which will be demanding answers about the situation

After brainstorming the potential communication challenges an outbreak would pose, the working group participants discussed whether or not government and industry are prepared to respond to an outbreak tomorrow. Overall, the group felt that communicators are prepared to answer basic questions about this disease, but not more specific questions. And, some segments are more prepared than others. Participants also agreed that the sheer volume of interest in an outbreak will test the collective resources of industry and government, and they may not be sufficient. In addition, the group expressed concern about producer knowledge of the disease and what to do in an outbreak.

KEY AUDIENCES. Based on the communication priorities listed above, working group members identified the primary audiences to be reached in an outbreak:

- All producers of affected livestock (including trade media to reach those producers)
- Private and government animal health professionals
- Internal audiences (agriculture industry and stakeholder organizations)
- Consumers (including media to reach consumers)
- Third-party experts (groups and individuals serving in advocacy/education roles)

- Channel partners (including channel trade media to reach retail and foodservice)
- Public health officials and private health professionals
- Elected officials
- Nongovernmental organizations and advocacy groups

PRIORITIES. The Outbreak Communications working group determined its top actionable priorities to be:

- Facilitating a coordinated industry/government response to an FMD outbreak
- Reaching out to, and educating, key audiences to establish industry as an information source
- Enhancing producer education about FMD in cooperation with the Disease Detection working group

NEXT STEPS

Participants brainstormed next steps for each of the key audiences identified by the group. Potential tactics were in the areas of building relationships, developing information materials, enhancing Web site resources and conducting briefings. The group determined the following short-term actions to be most important:

- Establishing better coordination among agriculture industry groups, including ongoing communication
- Implementing producer education efforts by building on existing materials and coordinating across species groups
- Inventorying existing crisis preparedness plans to create core informational materials for key audiences and enhance/coordinate state veterinarian outreach

The working group determined the members should meet again in 2007 to encourage coordination on these actions and conduct the inventory/assessment of crisis plans to set a base for additional tactics.

CONSUMER PERCEPTIONS: FMD VERSUS BSE

Many consumers associate BSE characteristics — recent cases, infected feed — with FMD, which may explain why two-thirds think FMD is a human health concern.



CONSUMER PERCEPTIONS: FMD IS A HEALTH CONCERN

More than 70 percent of consumers think FMD affects humans and 69 percent say people can get it by consuming infected meat.



STOPPING DISEASE PROGRESSION

Moderator: Bob Larson, DVM, Ph.D., Kansas State University, Animal Health Network

The Stopping Disease Progression working group met at the FMD Summit to:

- Identify key challenges, strategic needs and points of success related to vaccination, depopulation, quarantines and stop-movement orders
- Develop actionable initiatives to help respond to, and contain, an FMD outbreak with a focus on stopping the spread of the disease in the early hours of an outbreak (specifically related to response and prevention)
- Develop a clear understanding of government priorities and action steps for preparing to stop FMD

INTRODUCTION. Peter Mason, Ph.D., with the National Center on Foreign Animal and Zoonotic Disease Defense at the University of Texas Medical Branch opened the working group session by raising questions about how to stop FMD progression if an outbreak occurs. Mason emphasized that vaccination of animals before, during and following a potential FMD outbreak has many scientific and political implications. For example, the FMD virus has at least seven serotypes and many subserotypes, making it difficult to prepare vaccines for an outbreak. Also, the loss of trading partners needs to be factored into any decision to vaccinate — different markets have different sensitivities for accepting vaccinated animals.

Mason discussed the many facets of a stop-movement order, including its potential effect on animal welfare and business needs. Finally, Mason challenged the group to define trigger points for vaccination, stop-movement orders and depopulation.

CHALLENGES. The working group identified challenges that stand in the way of thoroughly and quickly halting progression of an FMD outbreak:

- Lack of nationwide premise identification
- False-positive FMD tests
- FMD detection and identification issues
- Lack of policy on when to use vaccinations
- Trade implications of vaccination
- Lack of consensus on quarantines and buffer zones
- Producer compliance with, and effectiveness of, stop-movement orders
- The effects of stop-movement orders on animal welfare and business needs
- Depopulation and disposal protocols
- Commodity producer group leadership and coordination
- State and federal government coordination
- Clear communication of government policies

PRIORITIES. The group agreed on three overarching priorities:

- Producers and other stakeholders need to be reminded that FMD is the No.1 animal health threat to the United States
- It is important to collectively seek buy-in and funding at the state and national levels to combat FMD
- Clear communication about current technology capabilities, limitations and policies is a key priority

These priorities were then divided into short-term and long-term action steps that need to be taken by stakeholders to prepare to stop the progression of an FMD outbreak.

NEXT STEPS

Short-Term

Commodity groups — such as groups representing the cattle, swine, dairy, sheep and goat industries — need to become more involved with FMD planning. This includes increasing monetary support for FMD preparedness, training leadership on how to respond to an FMD outbreak and educating producers about the disease. The working group determined that a cross-species industry task force needs to be created to help develop risk-based strategies, including strategies for business continuity, meat and milk issues, input (feed and other supplies) needs, personnel requirements and depopulation breakpoint parameters. Finally, the working group decided that a better understanding of vaccine capabilities, limitations and timelines should be developed.

Long-Term

Members of the working group will continue research on FMD interventions, such as vaccination, depopulation, quarantines and stop-movement orders. The group also hopes to gain a better understanding of FMD transmission and how regional differences (such as differences between high-plains states and dairy states) factor into FMD progression.

FMD PREPAREDNESS EVALUATION

Attendees at the Foot and Mouth Disease (FMD) Summit completed a pre- and a post-meeting evaluation form. These forms asked attendees about their views on the readiness of various sectors to respond to an FMD outbreak using a scale from one (not at all prepared) to seven (highly prepared). Response percentages in the top-two box (6-7) and bottom-two box (1-2) of the scale indicate respondents' feelings that sectors were either well prepared or not well prepared. Sectors included federal and state governments, the livestock industry, the food industry and colleges and universities. Summit attendees also were asked about their key learnings from the meeting.

EVALUATION OF FMD PREPAREDNESS. Both prior to and following the Summit, most attendees viewed industry sectors as moderately prepared for an FMD outbreak. However, post-meeting evaluations showed shifts in attitude about readiness to respond in some areas. For example, there was a significant negative shift in the percentage of attendees who thought that government and industry were well prepared to rapidly and effectively *detect* an FMD outbreak. Prior to the Summit, 25 percent of attendees thought government and industry were well prepared but, after the meeting, this dropped to 9 percent.

A positive shift occurred in attendees' perception of government and industry readiness to *stop progression* of the disease in an FMD outbreak. Prior to the Summit, 27 percent of attendees thought government and industry were not well prepared to stop disease progression but this figure dropped to only 13 percent after the meeting.

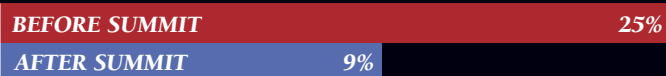
Another positive shift occurred in attendees' perspectives regarding their *personal readiness* to respond to an FMD outbreak. Prior to the Summit, 19 percent of attendees believed they were not well prepared to respond to FMD but, after participating in the Summit, that figure shifted to only 4 percent of attendees who believed they were not well prepared.

KEY LEARNINGS. The evaluations also gave participants the opportunity to share their key learnings from the FMD Summit. A majority of participants said they learned government and industry have similar priorities, are closely aligned in their goals and action steps and are interested in an integrated FMD response.

According to the evaluations, participants felt they gained a better understanding of current preparedness efforts at the Summit. However, they had both positive and negative reactions to current efforts in place. Participants had favorable comments after learning about the importance of preparedness, the amount of work already done, understanding what preparedness means for both government and industry and feeling better prepared. However, participants also noted that an FMD outbreak could have a catastrophic effect, there remains a lack of preparedness, much work still needs to be done and the country is currently not ready to deal with an outbreak. A third important area of learning was the importance of coordinated communication both within the industry and between industry and government. A number of Summit participants mentioned learning about the work being done on vaccine development and how vaccines would be used in the event of an outbreak.

SUMMIT ATTENDEES PERCEPTIONS OF FMD PREPAREDNESS

Government and industry ARE well prepared to rapidly and effectively detect an FMD outbreak



Government and industry ARE NOT well prepared to stop disease progression



You as an attendee ARE NOT well prepared to respond to FMD



Source: FMD Summit Meeting Evaluation Results, October 2006

